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experiments in which the electric spark was found to have penetrated through the side of a glass globe blown to an extreme degree of thinness. An electric jar, from which the air had been partially exhausted, could not be made to receive as high a charge as when the contained air was of the usual density, and when entirely exhausted could not be charged in any sensible degree; when filled with condensed air on the other hand, it retained a higher charge than before. The heated and consequently rarefied air surrounding a red-hot iron rod is found to conduct electricity with great facility. The same property is observed in the flame from a blowpipe, which may be regarded as a hollow cone containing highly rarefied air; as also, in a larger scale, in that of a volcano. Sir H. Davy had concluded from his experiments on voltaic electricity, that the conducting powers of metals are diminished by heat; but Mr. Ritchie infers from several experiments which bear more directly upon the question, that the metals afford no exception to the general law, that in all bodies heat increases the conducting powers; and explains the apparent anomaly in Sir H. Davy's experiments, by the dissipation of the electricity by the rarefied air surrounding the heated metals, which were used as conductors. He concludes his paper by describing an experiment which appears to establish, in respect to this law, a striking analogy between the electric and magnetic influences.

On Magnetic Influence in the Solar Rays. By Samuel Hunter Christie, Esq. M.A. F.R.S. &c. Read June 19, 1828. [*Phil. Trans.* 1828, p. 379.]

From the experiments described by the author in a former paper, it appeared that a magnetized needle vibrated under exposure to the sun's rays, came to rest sooner than when screened from their influence; that a similar effect was produced on a needle of glass or of copper, but that the effect on the magnetized needle greatly exceeded that upon either of the others. In the prosecution of this inquiry, the author has endeavoured to vary the experiments so as to obviate several causes of inaccuracy which might tend to invalidate the general conclusions he had before drawn. His first object was to compare the effects of the solar rays on an unmagnetized steel needle with one that was magnetized under the same circumstances; and the result was, that the latter was influenced in a more considerable degree than the former; and a similar difference was observed when the vibrations of a magnetized needle were compared with those of a needle made of glass or of copper. He ascertained that the diminution of the terminal arc of vibration, on exposure to the sun, was not occasioned merely by the heat imparted to the needles or surrounding medium, although this cause appeared in some instances to measure the intensity of the action which produced the diminution. In order to determine the comparative influence of the separate rays, he allowed them to fall on the needles after transmission through differently coloured fluids and glasses; but owing to

want of opportunity, he was obliged to abandon the inquiry before arriving at any determinate results : though as far as they went, they appeared to confirm the conclusion that the effects were dependent on the degree of light, and not on that of the heat. The red rays, however, appeared to have a greater effect in diminishing the terminal arc than the blue. In order to determine the single effect of temperature, independently of light, the needles were vibrated in close vessels surrounded with water of different temperatures ; the results showed that the terminal arc was increased in air of higher temperatures, which is the reverse of what takes place from the direct influence of the solar rays ; and that this effect, instead of being different in the magnetized and in the other needles, was nearly the same in all, of whatever materials they consisted, and whether magnetized or not. The author next endeavoured to ascertain the effects produced on the axes of vibration by the action of a common fire ; these, though much less in degree, he found to be similar in kind to those of the sun.

The Bakerian Lecture. On a Method of rendering Platina malleable.
By William Hyde Wollaston, M.D. F.R.S. &c. Read November 20, 1828. [*Phil. Trans.* 1829, p. 1.]

In this paper the author details the processes which, from long experience in the treatment of platina, he regards as the most effectual for rendering that metal perfectly malleable. When it is purified by solution in aqua regia, and precipitation with sal-ammoniac, sufficient care is seldom taken to avoid dissolving the iridium contained in the ore by due dilution of the solvent. The author states the exact degree of dilution requisite for this purpose, and the exact proportions in which the two acids are to be used. The digestion should be continued for three or four days, with a heat which ought gradually to be raised ; and the fine pulverulent ore of iridium allowed to subside completely before the sal-ammoniac is added. The yellow precipitate thus obtained, after being well washed and pressed, must be heated with the utmost caution, so as to expel the sal-ammoniac, but at the same time to produce as little cohesion as possible among the particles of platina. It is then to be reduced to powder, first by rubbing between the hands, and next by grinding the coarser parts in a wooden mortar with a wooden pestle ; because the friction of any harder substance would, by producing burnished surfaces, render them incapable of being welded together by heat. The whole is then to be well washed in clean water.

In this process the mechanical diffusion through water is made to answer the same purposes as liquefaction by heat in the case of the other metals ; the earthy impurities being carried to the surface by their superior lightness, and the effect of fluxes being accomplished by the solvent powers of water.

The grey precipitate of platina being thus obtained in the form of an uniform mud or pulp, is now ready for casting, which is effected